

INTISARI

Lidah buaya telah dipelajari dan dikembangkan secara luas untuk bahan pembalut luka karena sifatnya yang menguntungkan seperti anti bakteri, tidak beracun, *biodegradable*, dan biokompatibel. Penelitian ini bertujuan untuk membuat membran *nanofiber* dari *Aloe vera*-ekstrak / PVA-*Aloe vera* alami dengan berbagai konsentrasi *Aloe vera*-ekstrak (0, 1, 3 dan 5%) dengan metode *electrospinning*, dan untuk mengkarakterisasi morfologi dan sifat tarik dari membran *nanofiber*.

Penelitian ini dimulai dengan menyiapkan larutan pemintalan. Ada tiga larutan pemintalan: yaitu larutan PVA (10 wt.%), PVA-*Aloe vera* alami (30% w / w) dan *Aloe vera*-ekstrak / PVA-*Aloe vera* alami dengan berbagai konsentrasi *Aloe vera*-ekstrak (0, 1, 3 dan 5%). Viskositas larutan diukur dengan viskometer. Proses *electrospinning* dilakukan pada tegangan DC 15 kV, *tip to collector distance* (TCD) 12,5 cm, dan diameter *spinneret* 0,8 mm. Membran diuji tarik menurut ASTM D288, dan serat morfologi ditandai dengan *scanning electron microscope* (SEM).

Hasil penelitian menunjukkan bahwa peningkatan konsentrasi *Aloe vera*-ekstrak dapat meningkatkan viskositas larutan pemintalan, yang mengarah pada pengurangan keseragaman diameter serat. Sementara itu, elastisitas regangan dan modulus membran menghasilkan kisaran antara masing-masing 32,63 - 61,13 MPa dan 17,24 - 26,8 Mpa. Penambahan *Aloe vera*-ekstrak ke PVA-*Aloe vera* alami dapat meningkatkan sifat tarik membran di mana penambahan *Aloe vera*-ekstrak 1% adalah kekuatan tarik tertinggi (8,01 MPa).

Kata kunci: *Aloe vera* alami, *Aloe vera*-ekstrak, PVA, *Electrospinning*, membran *nanofiber*

ABSTRACT

Aloe vera has been extensively studied and developed for wound dressing material because of its advantageous properties such as anti-bacterial, non-toxic, biodegradable, and biocompatible. This study aims to fabricate the nanofiber membranes of Aloe Vera-extract/PVA-natural Aloe Vera with varying concentrations of Aloe Vera-extract (0, 1, 3 and 5%) by electrospinning method, and to characterize the morphology and the tensile properties of the nanofiber membranes.

This research was started by preparing spinning solutions. There are three spinning solutions: i.e. PVA solution (10 wt.%), PVA- natural Aloe Vera (30% w/w) and Aloe Vera-extract/PVA-natural Aloe Vera with varying concentrations of Aloe Vera-extract (0, 1, 3 and 5%). The viscosity of the solutions was measured with a viscometer. Those solutions were then electrospun at 15 kV DC voltage, tip to collector distance (TCD) of 12.5 cm, and a spinneret diameter of 0.8 mm. The membranes were tensile tested according to ASTM D288, and the fiber morphology was characterized by scanning electron microscopy (SEM).

The results showed that an increase in the concentration of Aloe Vera extracts increased the viscosity of the spinning solution, which leads to the reduction in the uniformity of fiber diameter. Meanwhile, the strain and modulus elasticity of the membranes resulted in the range between 32.63 - 61.13 MPa and 17.24 - 26.8 Mpa, respectively. The addition Aloe Vera extracts to the natural PVA-natural Aloe Vera can improve the tensile properties of the membranes in which the addition of 1% Aloe Vera-extract is the highest tensile strength (8.01 MPa).

Keywords: natural Aloe Vera, Aloe Vera-extract, PVA, Electrospinning, nanofiber membrane